FINAL REPORT

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THICKWOOD HILLS SHORT SEASON AGRONOMY SITE

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THICKWOOD HILLS SHORT SEASON AGRONOMY SITE - RABBIT LAKE, SASKATCHEWAN REPORT

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SITE:

The Thickwood Hills Short Season Agronomy Site is located 1 mile north and 3 miles west of Rabbit Lake (S1/2 29-48-13 W3) in the R.M. 467. Rabbit Lake is located in the Moist Black Soil Climatic Zone. The soil is an Oxbow/Whitewood loam with a pH of 7.0 to 8.0 and an electrical conductivity reading of 0.2 to 0.5 (non-saline). Rabbit Lake has an average frost-free growing season of 87 days. In addition to a short growing season the mean monthly growing season temperatures are typically less than the rest of the province. The District 34 ADD Board leases the site from Rudi Peters.

CLIMATIC CONDITIONS AT RABBIT LAKE IN 2001

The spring was dry giving crops a slow start. The summer was also hot and dry. There was a significant shower in early July that provided needed moisture to the parched landscape. The rest of the year remained dry.

Introduction:

The District 34 ADD Board and Saskatchewan Agriculture and Food Extension Service created the Thickwood Hills Short Season Agronomy Site to address the concerns of area producers. Rabbit Lake was chosen as the location for a variety of reasons. Farmers in this area must deal with a short frost-free growing season. To compound the problem, the grain elevators have closed which will result in the abandonment of the rail line. This will funnel grain south increasing transportation costs, forcing more on farm storage thus making grain production less appealing. The objective of this extension site is to promote sustainable annual and perennial cropping systems to help producers adapt to their climatic and transportation challenges.

The Thickwood Hills Short Season Agronomy Site requires the support of numerous agencies for success. The organizers appreciate the technical support of the Crop Development Center, University of Saskatchewan, the Agriculture and Agri-Food Canada Research Farm at Scott, the Saskatchewan Forage Council, and Rudi Peters' farm. Industry sponsorship includes Ducks Unlimited, Prairie Seeds, Western Grain Cleaning and Processing and the Saskatchewan Wheat Pool in Glaslyn and Rabbit Lake, Agricore and Cargill. Small plot seeding was contracted to the Saskatchewan Forage Council, Saskatoon, Sask.

DESCRIPTION OF TESTS AND DEMONSTRATIONS

There were fourteen tests and demonstrations in 2001, which reflect crops and cropping practices suitable for a short growing season. These consist of annual short season crops, perennial forages and annual forages.

The tests include:

1) Economics of perennial forage vs. annual crops
2) Cicer Milkvetch demonstration
3) Saskatchewan Forage Council test
4) Timothy variety test
5) Forage variety demonstration
6) Canola variety trial
7) Pea variety trial
8) Annual cereals for green feed
9) Westford forage barley
10) Corn demonstration
11) Early Maturing Sunflower demonstration
12) Italian Ryegrass demonstration
13) Low density canola demonstration
14) Winter cereal demonstration

1. ECONOMICS OF PERENNIAL FORAGES vs. ANNUAL CROPS

Forages are well adapted to the Rabbit Lake area due to its short growing season. Crop prices have been low for the past few years, therefore forage crops provide many advantages including:

Permanent ground cover,
Soil erosion minimized,
Efficient use of soil moisture,
Early maturity,
Distribute the harvest workload,
Residue is a valuable feed source.

The objective of the test is to compare the economics of grass seed production and annual crops. The grass seed species being evaluated are Fleet Meadow brome, Magna Smooth brome, Kirk Crested Wheatgrass, and James Dahurian Wild Rye grass. Annual crops grown for comparison are CDC Dolly Barley, Scuba Field Peas and Westwin (B. Rapa) Canola.

STUDY DESCRIPTION

The test design is a strip trial with variety and species replicated three times. The forage plots are 8 feet by 26 feet. The Saskatchewan Forage Council seeded the forages in 1998.

Annual Crops

Seeding Date:	May 24, 2001		
Seeding Rate:	Canola	5.0 lbs/ acre	
	Barley	96 lbs/ acre	
	Scuba	210 lbs/ acre	
Fertilizer:	Canola	60lbs N	20lbs P
	Barley	17lbs N	20lbs P
	Peas	17lbs N	20lbs P
Weed control:	Canola	Assure II	200ml/acre
		Muster	12g/ acre
		Sure-Mix	0.5L/ 100L spray solution
	Barley	Puma Super	300ml/acre
		Curtail	800ml/ acre
	Peas	Odyssey	17g/ acre

Forages

Seeding Date:	Spring 1998
Fertilizer:	80lbs N/ acre all plots, spring 2001
Harvest Dates:	August 11, 2001 and August 24, 2001

RESULTS

Table 1: Fertilizer and herbicide costs (2001).

Product	Canola	Peas	Barley	Forages
Nitrogen	$20.40	$5.78	$5.78	$27.20
Phosphorous	$6.40	$6.40	$6.40	0
Herbicides	$19.95	$25.67	$27.00	-
Total Cost	**$46.75**	**$37.85**	**$39.18**	**$27.20**

Table 2: Forage vs. annual crops 2001 returns. Prices as of December 15, 2001

Crop	Yield (lbs /acre)	Price ($/lb)	Gross ($)	Costs ($)	Net ($)
Magna SB	240 b	0.45	108	27.20	80.80
Fleet MB	0 c	2.05	0	27.20	(27.20)
Dahurian WR	1150 a	1.00	1150	27.20	1122.80
Crested WG	306 b	1.21	370.26	27.20	343.06
	(bus /acre)	($/bus)			
Canola	17.9	7.54	134.96	46.75	88.21
Barley	82.6	2.70	223.02	39.18	183.84
Peas	8.9	3.40	30.26	37.85	(7.59)

Yields with the same letter are not significantly different

Forage seed crops are in their third year of production. Yield has dropped off compared to previous years. Fleet meadow brome is known to lose production in older stands. In 2001, production dropped to zero. Hot dry weather in the spring may have had some impact but one should expect older stands to drop in production.

Pea production was excessively low due to poor stand establishment. Peas were seeded late. They were also seeded deep into moisture, thinning the stand. Canola and barley yields were average for the area.

Table 3: Forage vs. annual crops average net returns.

Year	Peas	Canola	Barley	Crested Wheatgrass	Meadow Brome	Smooth Brome	Dahurian Wildrye
1998	79.65	151.20	35.22	0	0	0	0
1999	71.57	45.12	50.38	912.31	1370.32	231.27	324.57
2000	14.25	37.21	21.16	3038.40	1658.65	470.90	3373.2
2001	(7.59)	88.21	183.84	343.06	(27.20)	80.80	1122.80
Average	**39.47**	**80.44**	**72.65**	**1073.44**	**750.44**	**195.74**	**1205.14**

The annual crops had average yields but poor prices. Average returns for the forage seed were impressive. Yields of the forages were high, especially in 2000. The forage seed plots had low weed densities, and herbicide application was not required. This is generally not the case for commercial forage seed producers. Producers cannot realistically expect returns for forages to be as high as those obtained at the agronomy site but farmers who are looking for a profitable alternative crop should seriously consider forage seed production.

2. CICER MILKVETCH

Cicer milkvetch is a creeping low bloat legume well adapted to the Rabbit Lake area. It is slow to establish but persistent, making it a good choice as a pasture species. The objective of the test is to show the time required to establish Cicer Milkvetch and to familiarize producers with two different varieties.

STUDY DESCRIPTION

Seed Date:	May 18, 2000
Seeding Rate:	10 lbs/acre
Plots Size:	8 feet by 40 feet
Experimental Design:	strip, not replicated
Fertilizer:	none

There was some growth observed on August 2, the day of the tour. The forage was slowly covering the ground but there were some bare spots. When looking at the plot the first impression you get is that Windsor produced more than Oxley but sampling revealed there was not that much difference in yield.

RESULTS

Table 4: Dry matter yield of Oxley and Windsor cicer milkvetch 2001.

Variety	Yield (lbs/ac)	Protein (%)
Windsor	1054	10.96
Oxley	981	10.92

Cicer milkvetch is an excellent source of fall grazing. It provides a good level of protein especially in the fall when other forages drop in protein.

3. SASKATCHEWAN FORAGE COUNCIL VARIETY TRIAL

Since North West producers are looking at forages as an alternative to grain, this test will provide valuable technical data and will introduce varieties not commonly grown in the area. Forage varieties are evaluated in several parts of Saskatchewan but there were no demonstration plots in the North West part of the Province. Saskatchewan Forage Council's Rabbit Lake site was established to give a broad evaluation of forage production.

The plot was seeded in the spring of 1999. There was no cover crop. Weeds were "controlled" by mowing. No fertilizer was applied to the varieties. The 2001 growing season was the second time yield data was obtained.

STUDY DESCRIPTION

Seed Date:	Spring 1999
Plot Size:	4 feet by 20 feet
Experimental Design:	Randomized complete block, 4 reps
Weed Control:	none
Fertilizer:	none
Harvest Date:	July 2001
Treatments:	Spredor III, Roamer, Kay, Carlton, Paddock, Courtenay TF, Magna, Kirk, Heinrichs, Fleet, AC Grazeland, Climax, Chief, Rangelander, Beaver, Arthur, Algonguin, AC Nordican, Fairway, AC Blue Jay, AC Knowles

RESULTS

Table 5: Yields of various forages on the second year of cutting (2001)

Variety	Total Forage Yield Tons/Acre July 27, 2000	Total Forage Yield Tons/Acre July 25, 2001	2 Year Average Total Forage Yield Tons/Acre	**2 Year Average** Forage Yield %Kirk
Chief IWG	3.19	1.10	2.14	154
Arthur DWR	2.32	1.35	1.84	132
Rangelander Alfalfa	2.20	1.23	1.72	123
Heinrichs Alfalfa	2.44	.97	1.71	123
Beaver Alfalfa	2.08	1.29	1.68	121
Roamer Alfalfa	2.29	1.00	1.64	118
AC Nordican Alfalfa	2.16	1.06	1.61	116
Algonguin Alfalfa	2.13	1.02	1.58	113
Carlton SBr	2.18	.89	1.53	110
Spredor III Alfalfa	1.89	1.01	1.45	104
Kirk CWG	1.92	.86	1.39	100
AC Grazeland Alfalfa	1.88	.89	1.38	99
Fleet MBr	2.18	.53	1.35	97
AC Knowles Hybred Brome	1.95	.74	1.34	97
Magna SBr	1.77	.81	1.29	93
AC Blue Jay Alfalfa	1.77	.73	1.25	90
Courteney Tall Fesecue	1.92	.53	1.23	88
Climax Timothy	1.76	.64	1.20	86
Paddock MBr	1.77	.62	1.19	86
Fairway CWG	1.64	.73	1.19	86
Kay Orchard Grass	1.88	.49	1.19	86
Mean	2.06	.89	1.47	85
C.V. (%)[1]	18	21	19	

1. Coefficient of Variation

Saskatchewan Forage Council gathered forage yields on July 25, 2001. The plot is prescribed for one cut only Samples were dried in a hot air oven to determine moisture content. All yields are reported as 100% Dry Matter.

RESULTS

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1. Coefficient of Variation

Saskatchewan Forage Council gathered forage yields on July 25, 2001. The plot is prescribed for one cut only Samples were dried in a hot air oven to determine moisture content. All yields are reported as 100% Dry Matter.

Yields in the forages for 2001 were substantially lower than the 2000 season. Yields ranged from 50% to 30% of last years crop. The Chief intermediate wheat grass had the highest average yield of all the forages. The alfalfas also did quite well, with the tap root alfalfas not suffering as much as the creeping root alfalfa under the dry conditions in 2001. The other grasses did not fair too well either, probably due to their shallow root system.

4. TIMOTHY VARIETY TEST

Timothy is a valuable export crop but its use in the North West is limited. There is a huge potential for growth in Saskatchewan. The purpose of the test is to familiarize producers with timothy varieties and evaluate their yield potential in the Northwest.

STUDY DESCRIPTION

Seed Date:	Spring 1998
Plot size:	4 feet by 20 feet
Experimental design:	Randomized complete block design, 4 reps
Weed control:	none
Fertilizer:	80lbs/ acre N, spring 2001
Harvest Date:	July 25,2001
Treatments:	Dahurian wildrye, Kirk crested wheatgrass, Magna smooth brome, Fleet meadow brome, Goliath timothy, Drummond timothy, Motim timothy, Buffalo timothy, Timfor timothy, Botnia timothy, Farol timothy

RESULTS

Table 6: Yield and head length of timothy varieties (2001)

Variety	Total Forage Yield (tons/acre) 07/27/00	Average Head Length (inches) Timothy 2000	Total Forage Yield (tons/acre) 07/25/01	Average Head Length (inches) Timothy 2001	Average Forage Yield (tons/acre) 00 - 01	Fofage Yield % Kirk
Dahurian WR	3.85	-	1.05		2.45	109
Kirk CWG	**3.67**	**-**	**0.82**		**2.25**	**100.00**
Goliath timothy	3.46	2.48	1.01	1.64	2.24	100
Magna SBr	3.09	-	1.08		2.09	93
Fleet MBr	2.98	-	0.66		1.82	81
Drummond timothy	2.59	2.03	0.68	1.78	1.63	73
Motim timothy	2.33	2.69	0.84	2.01	1.59	71
Buffalo timothy	2.25	2.17	0.82	1.83	1.54	68
Botnia II timothy	2.16	1.89	0.79	1.64	1.47	66
Timfor timothy	2.19	2.23	0.62	1.50	1.40	62
Farol timothy	2.14	1.82	0.56	1.49	1.35	60
Mean	2.79	2.36	0.81	1.70	1.80	
C.V. (%)	21		24		25	

Yields of the timothy varieties dropped to 30% of last year's yields. The dry conditions were hard on grass species because of their shallow root system. Goliath timothy had the best yield of all the timothy varieties on a two-year average. It had high dry matter yield and a long head length, both of which are important to the export market.

5. FORAGE CROP DEMONSTRATION

The forage crop demonstration was established in 1997. The lack of rain in 2001 did not inhibit growth as much as one would expect. The forages were slow to start in the spring due to the dry conditions. The plots were mowed on July. Participants in the annual tour were able to observe the plots following nearly one month of regrowth.

The treatments are:

Low-creep smooth bromegrass
Rangelander creeping root alfalfa
Carlton smooth brome
Swift Russian wild ryegrass
Low-creep smooth brome grass and Beaver alfalfa
Paddock meadow brome
Carlton brome and Beaver alfalfa
Chief intermediate wheat grass
Beaver alfalfa
Paddock meadow brome grass and Beaver alfalfa
AC Grazeland alfalfa (low bloat alfalfa)
Carlton brome grass and Beaver alfalfa cross-seeded
Low-creep smooth brome & Beaver alfalfa cross-seeded
Paddock meadow brome grass and Beaver alfalfa cross-seeded

The Dahurian wildrye plot has completely died out since it is not a long-lived species. Kirk crested wheat grass did not have good regrowth because most of its growth is early in the spring.

6. CANOLA VARIETY TEST

Due to tight margins with grain crops producers are looking to maximize revenues on seeded crops. One way to accomplish this is to sign production contracts for specialty canola varieties. These are different from conventional canola in that they have been bred to produce special oil profiles for the food and industrial oil markets. Companies pay a premium to producers who grow these varieties.

STUDY DESCRIPTION

Seed Date:	May 24, 2001
Plot size:	4 feet by 20 feet
Experimental design:	Randomized complete block design, 3 reps
Weed control:	Muster Gold II: Muster 12 g/acre : Assure II 0.2 liter/acre
Fertilizer:	50lbs/ acre N, 20 lbs/ acre P/ acre

Harvest Date: September 23, 2001
Treatments: IMC 105, 44A89, AC Sunbeam, Nexera 705, Nexera 710, LG3930, Millenium 03

RESULTS

Table 7: Yield and green seed percentage of canola varieties (2001)

Variety	Yield (kg/ha)	Yield (bus/acre)	% Green
Nexera 705	1140 a	20.3	6.2
Nexera 710	1123 a	20	8.0
44A89	1043 a	18.6	3.8
Millenium 03	1040 a	18.5	5.4
IMC 105	1013 a	18	12.2
AC Sunbeam	1007 a	17.9	0.8
LG 3930	803 a	14.3	17.2
LSD	**456.7**		
CV	**25.6**		

Means with the same letter are not significantly different

The specialty canola varieties have similar maturities as B. napus varieties since they were seeded relatively late (May 24). The low yields and high green counts reflect this. The varieties were seeded shallow (1/2") so they were did not germinate evenly. Weed infestation was high. Diamondback moth damage was negligible. There no significant difference between yields but there was a large difference between green counts that reflect the risk of growing Argentine varieties in an area with a short growing season. 44A89 is a conventional early argentine (B. napus) and AC Sunbeam is a polish (B. rapa) variety.

7. PEA VARIETY TEST

Pea acreage is at a record level in Saskatchewan. Peas are grown because they have several agronomic advantages. Peas break the disease cycle in cereal rotations, they can fix nitrogen in the soil thereby reducing fertilizer costs and they have a short growing season. In order to maximize profits producers must choose a variety that has a high return so the objective of the test is to evaluate several pea varieties for yield.

STUDY DESCRIPTION

The pea plots had 17 lbs/ acre of nitrogen and 20 lbs/ acre of phosphorus surface applied and incorporated. The plots were seeded with a double disc press drill with one foot spacing.

Seed Date: May 24, 2001

Target Density:	90 plants / m^2
Plot Size:	4ft x 20ft
Experimental Design:	Randomized Complete Block, 3 replicates
Weed Control:	Odyssey 17g/ acre June 20, 2001
Fertilizer:	17lbs N/acre and 20 lbs P/acre
Innoculant:	Granular 5lbs/acre
Harvest Date:	September 2, 2000 Square meter sample (one per plot)
Treatments:	Pekisko, Delta, Carneval, Swing, Scuba, CDC Mozart, Nitouche, Alfetta, Highlight, Espace

RESULTS

Table 8: Pea yields for the 2001-growing season.

Variety	Seeding Rate bus /acre	Seed Color	Yield kg/ha	Yield bus /acre
Carneval	2.6	Yellow	850 a	12.6
Pekisko	2.4	Green	797 ab	11.8
Highlight	1.8	Yellow	767 abc	11.4
Delta	2.5	Yellow	753 abc	11.2
Swing	2.7	Yellow	740 abc	11
Alfetta	3.5	Yellow	667 abc	9.9
CDC Mozart	2.9	Yellow	623 abcd	9.2
Scuba	2.7	Green	597 bcd	8.9
Nitouche	3.7	Green	547 cd	8.1
Espace	2.8	Green	430 d	6.4
LSD			229.4	
CV			19.7	

Yields with the same letter are not significantly different

Pea yields this year were quite low. Even though there was a lack of precipitation during the year, yields at the agronomy site were below local averages. The seeding date was late. Since moisture was scarce the peas were seeded deep into moist soil. This reduced the number of plants that actually emerged. Plant density was well below target, thus lowering yields.

8. CEREALS FOR GREENFEED

Record low grain prices coupled with record high cattle prices make green feed an attractive option. The proper choice of a green feed crop is essential to maximize yield and quality. Returns per acre for a baled or ensiled cereal crop can exceed the return for the same crop harvested for grain. The purpose of the study is to determine the dry

matter yield and the protein level of various cereal crops. The potential grain yield of the crop was also examined to determine a crop that would make a good dual-purpose crop. An economic analysis of grain production vs. green feed production will also be done.

STUDY DESCRIPTION

The green feed plots had 17lbs/ acre of nitrogen and 20lbs/ acre of phosphorus surface applied and incorporated. The plots were seeded with a double disc press drill with one foot spacing.

Seed Date:	May 24, 2001
Target Density:	250 plants/ m^2
Plot Size:	4ft x 20ft.
Experimental Design:	Randomized Complete Block, 3 replicates
Weed Control:	Buctril M 400ml/acre, June 29, 2001
Harvest Dates:	August 24, 2001 September 23, 2001 Square meter samples were taken (two per plot)
Fertilizer:	17 lbs N/acre and 20 lbs P/ acre
Treatments:	CDC Pacer, CDC Bell, AC Rosser, CDC Dolly, Excel, AC Morgan, Prima, AC Copia, CDC Teal, AC Belmont, Calibre, Derby, CDC Boyer

RESULTS

Table 9: Green feed yield and production data for the 2001-growing season.

Cultivars	Seeding Rate (bus./acre)	DM Yield (lbs/acre)	Protein (%)	Harvest Stage	Yield (bus./acre)	Bushel Weight (lbs/bus)
AC Rosser	2.0	9277	10.22	Soft dough	101.1	36
AC Copia	1.3	7757	8.88	Early milk	53.8	52
CDC Baler	2.9	7751	8.5	Late milk	78.7	35
AC Morgan	2.6	7453	8.93	Late milk	90.4	38
Derby	2.6	6946	9.47	Late milk	75.7	38
CDC Dolly	2.3	6848	10.06	Late milk	82.6	48
CDC Pacer	2.6	6241	9.45	Mid milk	80.4	36.5
CDC Boyer	2.9	5852	8.58	Soft dough	76	35.5
Excel	1.7	5049	9.50	Soft dough	65	38
CDC Teal	1.1	4624	10.75	Late milk	26.8	56
Calibre	3.1	4164	10.04	Late milk	72.2	38.5
AC Belmont	1.2	4082	10.27	Mid milk	24.1	35
Prima	1.1	3289	12.21	-	-	-

Green feed yields are about 70% of the yields last year. This is to be expected because of lack of moisture. Considering the conditions a 30% drop in yield is not bad since some producers experienced a 50% or more drop in yield. Rosser barley is the only variety in the trial that increased its yield from last year. It's grain yield also increased. Most varieties still managed to produce over two tons/acre. Prima fall rye was in the vegetative stage since it was planted this year. Prima's yield is deceiving because it could be grazed many times during the season thus multiplying it's yield.

Table 10: Gross returns of green feed vs. grain.

Crop	Yield (tons/acre)	$/ton	Gross	Grain Yield (kg/ha)	Yield (bus./acre	$/bus.	Gross
AC Rosser	4.63		259.28	5453 a	101.1	2.70	272.97
AC Copia	3.87		216.72	3267 c	53.8	3.50	188.30
CDC Baler	3.87		216.72	3007 c	78.7	2.83	222.72
AC Morgan	3.72		208.32	3453 c	90.4	2.83	255.83
Derby	3.47		194.32	2890 b	75.7	2.83	214.23
CDC Dolly	3.42		191.52	4453 c	82.6	2.70	223.02
CDC Pacer	3.12	56.00	174.72	3070 c	80.4	2.83	227.53
CDC Boyer	2.92		163.52	2903 c	76	2.83	215.08
Excel	2.52		141.12	3503 c	65	2.70	175.50
CDC Teal	2.31		129.36	1810 d	26.8	3.50	93.80
Calibre	2.08		116.48	2757 c	72.2	2.83	204.33
AC Belmont	2.04		114.24	1030 d	24.1	2.83	68.20
Prima	1.64		91.84	-	-	-	-
LSD				**826.1**			
CV				**15.6**			

Grain yields with the same letter are not significantly different

Since grain prices have increased the economics of greenfeed production have changed since last year. It is hard to pinpoint the exact price of greenfeed since its demand varies within the province. Grain prices have nearly tripled for oats since last year making them much more valuable in the bin than in the bale. If greenfeed prices were at $70/ton that would sway the economics back towards greenfeed production. The wheat and hulless oats had low grain yields because of deer damage, which makes their grain yields deceiving.

9. WESTFORD FORAGE BARLEY

A new hooded barley variety was introduced on the market as a forage barley. Westford boasts high dry matter yields and is touted as a silage barley. Since Westford is bred to have no awns it eliminates the mouth cankers and palatability problems cattle encounter when fed mature awned barley.

STUDY DESCRIPTION

Seed Date:	May 24, 2001
Target Density:	250 plants/ m^2
Plot Size:	4ftx 20ft.
Experimental Design:	Strip, not replicated
Weed Control:	Buctril M 400ml/acre, June 29 2001
Harvest Dates:	August 24, 2001
	September 23, 2001

	Square meter samples were taken
Fertilizer:	17lbs N/acre and 20 lbs P/ acre

RESULTS

Dry matter yields and grain yields for Westford were obtained and the results are as follows:

Table 11: Grain and forage yield of Westford barley 2001.

Dry matter Yield (lbs/acre)	Protein (%)	Grain Yield (bus/acre)	Bushel Weight (lbs/bus)
6308	7.51	55.4	34

Westford barley had yields that were comparable with oat and barley yields. Bushel weights for Westford barley were fairly low (34lbs/bus). Westford barley is also very susceptible to smuts so the seed must be treated. The price of Westford barley in the spring of 2001 was $6.50/ bus. The fact that it does not have awns can make Westford an important part of your ration.

10. CORN DEMONSTRATION

Cattle producers are becoming less resistant to trying corn as an alternative cattle feed. Corn boasts a high dry matter yield, high energy levels and high protein levels. Unfortunately these benefits are tied to high seeding costs and a long growing season to achieve the full potential. Last year we determined the best seeding rate for corn is about 20lbs/acre. This year the objective of the demonstration is to try some varieties that are supposed to be better suited to our growing conditions.

The trial consisted of Amaizing Graze, Highlight Seeds (HLS) 128 and HLS 012 seeded in three strips at 20lbs/acre. Three fertilizer rates were used: 40lbs/acre, 60lbs/acre and 80lbs/acre. The strips were seeded with a double disc press drill with one foot spacing at two inches of depth into soil moisture.

STUDY DESCRIPTION

Seed Date:	May 24, 2001
Plot Size:	4 ft x 20ft
Experimental Design:	strip, not replicated
Seeding rate:	20lbs /acre
Weed Control:	Buctril M 400ml/acre
Treatment:	Amaizing Graze, HLS 128, HLS 012
Fertilizer:	Nitrogen 40 lbs, 60lbs, 80lbs.
	Phosphorus 20lbs

The corn seeded with different levels of nitrogen did not show a visual difference in yield. Samples were taken from corn fertilized with 60lbs N/acre.

RESULTS

Table 12: Yield and protein levels of corn planted at 20 lbs/acre and 60 lbs/acre N.

Variety	Yield (lbs/acre)	Protein (%)
HLS 128	5259	12.71
Amaizing Graze	4226	13.68
HLS 012	4151	9.73

The corn was planted relatively late for maximum yield potential. One must balance early seeding with risk of frost. The year provided a lot of heat with is what corn needs to produce well. Weed control is important because corn is not very competitive and there are few products available to control grassy weeds in corn. Still the yield of the corn was lower than oat and barley varieties. Corn can provide a good source of fall feed but is not the most cost effective source of feed.

11. EARLY MATURING SHORT STATURE SUNFLOWERS

Since producers are always looking for new crop options sunflowers should be examined as an option for local grain growers. New varieties of sunflowers have been developed that do not require as long of a growing season. The objective of the study is to determine the viability of sunflowers in the Rabbit lake area.

STUDY DESCRIPTION

Seed Date:	May 24, 2001	
Plot Size:	4 ft x 20ft	
Experimental Design:	strip, not replicated	
Seeding Rate:	1 plant/ 2.5 ft^2	
	1 plant/ 2 ft^2	
	1 plant/ 1 ft^2	
Weed Control:	Hand weeding	
Treatment:	IS 6111	
Fertilizer:	Nitrogen	40lbs/acre
	Phosphorus	20lbs

RESULTS

Yield data was taken from the strip of sunflowers that were seeded at a rate of 1plant/ft^2. The ideal density for sunflowers is 1plant/2ft^2 but under field conditions the planting rate that was supposed to be 1plant/ft^2 turned out to be 1plant/2ft^2 because of poor germination. The yield obtained from the strip was 409.4 lbs/acre. The guide lines for

sunflowers is that a 1000lbs/acre is adequate under drought conditions, 2000 lbs/acre is a good yield and 3000 lbs/acre is a great yield. There was some yield loss from birds. This year is probably one of the few years that offered enough heat to even produce a crop. Taking all that into account, sunflowers are not a viable crop for the Rabbit Lake area.

12. RYEGRASS DEMONSTRATION

Producers looking to extend their grazing season should look at annual ryegrass as a good fall pasture. Planted in the spring it matures by fall, providing cattle with a good quality late season pasture. Ryegrass also forms a thick fibrous root system two inches under the soil, helping to stabilize the soil and avoid erosion. The objective of the study is to familiarize producers with two different ryegrasses, determine the proper seeding rate and to evaluate their productive ability.

STUDY DESCRIPTION

Seed Date:	May 24, 2001
Plot Size:	4 ft x 20ft
Experimental Design:	strip, not replicated
Weed Control:	Buctril M 400ml/acre, June 29, 2001
Treatment:	Frederick and Aubade
Seeding rate:	8 lbs/acre, 12 lbs/acre and 16 lbs/acre
Fertilizer:	50 lbs/acre N and 20 lbs/acre P

RESULTS

Table 13: Yield of Italian ryegrass planted at 8lbs/acre.

Variety	Yield (lbs/acre)	Protein (%)
Frederick	2566	13.16
Aubade	1570	6.71

There are two types of ryegrass grown in this demonstration, Westerwolds and Italian. Italian is a biannual but does not survive the winter so it is essentially an annual. Aubade is a Westerwolds ryegrass and will produce a seed head in the year of production so grazing must be intense to keep ahead of it. Frederick is an Italian type and will stay vegetative all year and most likely will not survive the winter.

There was little visual difference between the ryegrass seeded at 8, 12, and 16 lbs/acre so it would be most economical to seed at 8 lbs/acre. The ryegrass varieties could be used in tandem. One could graze Aubade first and save the Frederick for fall. Both produce a large amount of forage quickly.

13. LOW DENSITY CANOLA DEMONSTRATION

Canola production has a firm foothold in the Northwest. Since production guidelines are common knowledge new ideas regarding production are few and far between. A new theory has emerged regarding seeding rate. Canola is considered to be "plastic" because the will fill in gaps in the canopy where room permits. If the stand is thin and each plant has a lot of elbow room, the canola plants will produce more branches and pods thus keeping the yield of a thin stand equal with one seeded at a proper density. The objective of the demonstration is to evaluate the yield difference of canola seeded at three different rates: 2lbs/acre, 4lbs/acre and 6lbs/acre.

STUDY DESCRIPTION

Seed Date:	May 24, 2001
Plot size:	4 feet by 20 feet
Experimental design:	Strip, not replicated
Weed control:	Muster Gold II: Muster 12 g/acre
	: Assure II 0.2 liter/acre
Fertilizer:	50lbs/ acre N, 21 lbs/ acre P applied with seed
Harvest Date:	September 23, 2001
Treatments:	AC Sunbeam 2lbs/acre
	4lbs/acre
	6lbs/acre

RESULTS

Table 14: Yield AC Sunbeam seeded at different rates.

Seeding rate (lbs/acre)	Yield (bus/acre)	Green Count (%)
2 lbs/acre	28.9	1.0
4 lbs/acre	28.6	0.8
6 lbs/acre	30.8	1.0

There was little difference between yields. It is hard to determine whether the risk of seeding canola at low rates is worth the saving in seed costs. To have an ideal low density canola would require the seeds to be spaced evenly though out the field so the crop would have an even canopy. The reality is that under field conditions seeds would not be evenly spaced. There would be small areas of densely seeded canola and areas of bare ground. This would result in the worst of both worlds - low yields and high weed populations. One lesson producers should gain from this demonstration is to reevaluate low seedling emergence because a low plant count does not necessarily translate into a low yield.

14. WINTER CEREALS

To take advantage of early spring moisture and avoid early fall frosts producers are seeding winter cereals. Winter cereals also minimize soil erosion, break up farm workload and can provide a source of fall or early spring grazing. The purpose of the demonstration is to familiarize producers with different varieties of winter wheat, fall rye and fall triticale. Fertilizer placement was also investigated.

STUDY DESCRIPTION

Seed Date:	September 11, 2000
Seed Rate:	65 lbs/acre
Plot Size:	7 feet x 60 feet
Weed control:	none
Experimental design:	Strip, not replicated
Harvest Date:	August 24, 2001
Treatments:	Clair winter wheat, Harrier winter wheat, Raptor winter wheat, Osprey winter wheat, Rifle fall rye, Pica fall triticale

RESULTS

The plots were seeded into barley stubble with a seven-foot versatile hoe-drill. Four varieties of winter wheat were used in the comparison. The method of nitrogen placement (seed placed and top-dressed) was examined. Osprey winter wheat was seeded with a phosphorus, potassium and sulfur blend at 22 lbs/acre. The four plots had 0lbs of N/acre, 23 lbs of N/acre, 46 lbs of N/acre and 69lbs of N/acre. Ammonium nitrate was applied in the spring April 15, under dry conditions, but moisture given off in the morning dew was enough to move nitrogen into the soil profile.

Table 15: Yields of winter cereals 2001.

Plot order:(west to east)

Variety	Blend (lbs/acre)	Actual Nitrogen (seed placed, lbs/acre) (fall 2000)	Actual Nitrogen (top dressed, lbs/acre) (spring 2001)	Yield (bus/acre
Clair	22	0	0	34.9
Harrier	22	0	0	26.8
Raptor	22	0	0	29.5
Osprey	22	0	0	33.2
Osprey	22	0	0	31.5
Osprey	22	23	0	25.6
Osprey	22	46	0	24.4
Osprey	22	69	0	30.9
Osprey	22	0	0	28.1
Osprey	22	0	23	29.2
Osprey	22	0	46	27.1
Osprey	22	0	69	21.9
Rifle	22	0	0	37.7
Pica	22	0	0	35

There was little difference in grain production between the different varieties of winter wheat. Moisture limited yield this year. Winter cereals are under utilized in the northwest area. Yields are comparable to hard red spring wheat without the risk of frost. New varieties are being developed with better bread making characteristics. Winter cereals can also be utilized as late fall grazing when pastures run out. There was little difference in grain production between Osprey that was fertilized in the fall vs. the spring. In a moisture-stressed year, it is difficult to determine the best method of applying nitrogen. Price may determine the best method. 2000 nitrogen prices were much lower than 2001 prices.

RECOMENDATIONS

Forage seed production should be seriously considered because of favorable economic returns. Windsor cicer milkvetch germinated more readily than Oxley but dry matter yields were similar. Chief intermediate wheat grass had the highest two-year average yield in the Saskatchewan Forage council test and orchard grass had the lowest. Timothy yields were highest for the cultivar Goliath over two years. There was no difference in the specialty canola yields this year. Pea yields were substantially lower than the local average. Rosser barley had the highest dry mater yield of the cereal forages this year and it had the highest gross return for grain yield also. Westford barley had a reasonable dry matter yield but may be expensive to grow because of high seed costs. The corn did have acceptable yields but it is an expensive forage to grow. Sunflowers are not a good crop

choice for northwest Saskatchewan. Annual ryegrass is a good option for late fall grazing. Canola seeded at low rates had the same yield as canola seeded at the proper rate. There was little difference between winter cereals fertilized in the spring or fall. There was also little difference in yield between winter cereals fertilized at different rates because moisture limited yield.

APPENDIX

2001 COSTS –FORAGE SEED TEST

Price List:

46-0-0	$350.00/tonne	= $.34/lb of N
12-51-0	$360.00/tonne	= $.32/lb of P
Odyssey	17g/acre	= $25.67/acre
Puma Super	300ml/acre	= $15.50/acre
Curtail	800ml/acre	= $11.50/acre
Muster Gold II	12g/acre	= $19.95/acre

Grass:

Herbicide: 0

Nitrogen: 80 lbs. N x $.34/lb of N = **$27.20**

Phosphorus: 0

Peas:

Herbicide: 17g/acre Odyssey = **$25.67**

P and N: 17 lbs N x $.34/lb of N =**$5.78**
20 lbs P x $.32/lb of P =**$6.40**

Canola:

Herbicide: Muster Gold II
= **$19.95**

P and N: 60 lbs. N x $.34/lb of N = **$20.40**
20 lbs. P x $.32/lb of P =**$6.40**

Barley:

Herbicide: 300 ml/ acre Puma Super + 800 ml/acre Curtail
= $15.50/acre + $11.50/acre
= **$27.00**

P and N: 17 lbs N x $ .34/lb of N =**$5.78**
20 lbs P x $.32 /lb of P =**$6.40**